

Work Order ID 60573

July 14, 2010 9:51:32 AM



Page 1

Item ID: D212-664-207

Accept



Setup Start



Revision ID:

Stop



Item Name: Crosstube Low Standard Aft

Start Date: 7/14/10 Start Qty: 1.00

Required Date: 7/23/10 Req'd Qty: 1.00



Cust Item ID:

Customer:

Reference:

Approvals: Process Plan:

Date:

Tooling:

Date:

QC:

Date:

SPC (Y/N):

Date:

Run Start



Stop



Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

Draw Nbr

Revision Nbr

D212-664-247

Rev B

100

0.00



DC

Document Control

DOCUMENT CONTROL

Memo

0.00

Photocopy bluefile and create labels as per PPP D212-664-207 CHG001

Sioloski

H. J. for BG 10-9-15

110

0.00



Packaging

Packaging

Pick Kit
Packaging

Memo

0.00

(IX) & MB 10-08-12

120

0.00



CNC Bend 2

CNC Alpha 160 Bender

BENDING MACHINE - CROSSTUBES

Memo

Bend tube as per Dwg D212-664-247 using CNC bender program and Folio FT

(IX) & MB 10-08-12

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Work Order ID 60573

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Item ID: D212-664-207

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Item Name: Crosstube Low Standard Aft

Start Date: 7/14/10 Start Qty: 1.00



Cust Item ID:

Required Date: 7/23/10 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan:

Date:

Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop



Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

130



QC

Quality Control

QC15- Crosstube Dimensional Check

0.00

Memo

0.00

8/10/08/17

(40)

140



Crosstubes

Crosstubes

Crosstubes

0.00

Memo

0.00

1-Drill Rivet holes as per Dwg D212-664-247 using DT8972.***Use T-Pin***

2-Drill pilot holes in tube as per Dwg D212-664-247 using DT8550 and DT8551

3-Ream hole to finish size in tube as per Dwg D212-664-247

4-Deburr & Inspect for surface damage. Repair damage within limits as per Dwg D212-664-247

5-Scribe part # and batch # using vibrating stylus as per Dwg D212-664-247

ms 10-08-17

BB 10/08/25

ms 10-08-18

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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Required Date: 7/23/10 Req'd Qty: 1.00

Customer:

Reference:

Run Start



Approvals: Process Plan:

Date:

Tooling:

Date:

Stop



QC:

Date:

SPC (Y/N):

Date:

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

150



HandFXtube

Crosstubes Chemical Conversion

0.00

Memo

0.00

Hand Finishing Crosstubes

Chemical Conversion Coat Tube & Cuffs

TX Q MB 10-08-25

160



QC

Quality Control

QC3- Inspect Part Finish

0.00

Memo

0.00

8/10/08/06

170



QC

Quality Control

QC5- Inspect part completeness to step on W/O

0.00

Memo

0.00

8/10/08/06

80

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
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			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Work Order ID 60573

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Item ID: D212-664-207

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Setup Start



Revision ID:

Stop



Item Name: Crosstube Low Standard Aft

Start Date: 7/14/10 Start Qty: 1.00



Cust Item ID:

Required Date: 7/23/10 Req'd Qty: 1.00



Customer:

Reference:

Run Start



Approvals: Process Plan:

Date:

Tooling:

Date:

Stop



QC:

Date:

SPC (Y/N):

Date:

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

180



Outsource2

Outsource process - NDT

Outsource process - NDT per QSI038 4.1

0.00

Memo

0.00

Liquid Penetrant Inspection as per QSI 038
Issue P/O: 12463 LPI as per ASTM 1417
Level 2 Attach copy of NDT results to work order

CZ 10/8/27 (1)

190



Packaging

Packaging

Receive & Inspect for Damage & Mat'l Certs

0.00

Packaging

Memo

0.00

Ensure copy of NDT results attached to work order.

P4/8/27 (1)

200



QC

Quality Control

QC5- Inspect part completeness to step on W/O

0.00

Memo

0.00

Inspect for damage & ensure results are as per Dwg D212-664-207

Sidorky

(N)

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Work Order ID 60573

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Item ID: D212-664-207

Accept



Setup Start



Revision ID:

Stop



Item Name: Crosstube Low Standard Aft

Start Date: 7/14/10 Start Qty: 1.00



Cust Item ID:

Required Date: 7/23/10 Req'd Qty: 1.00



Customer:

Reference:

Run Start



Approvals:

Process Plan:

Date:

Tooling:

Date:

Stop



QC:

Date:

SPC (Y/N):

Date:

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

210

0.00



Crosstubes

Crosstubes

Memo

0.00

1-Rivet and assemble Cuffs with T-Pin in the through bolt holes as per Dwg
D212-664-247. with Sika flex in Between tube & Cuff

AT 10-08-31

A/R SIKAFLEX -241/-291 BATCH: 115114

215

QC5- Inspect part completeness to step on W/O

0.00



QC

Memo

0.00

Inspect cuff with T-Pin

Quality Control

1005-09

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
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			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Work Order ID 60573

July 14, 2010 9:51:54 AM



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Item ID: D212-664-207

Accept



Setup Start



Revision ID:

Stop



Item Name: Crosstube Low Standard Aft

Start Date: 7/14/10 Start Qty: 1.00



Cust Item ID:

Required Date: 7/23/10 Req'd Qty: 1.00



Customer:

Reference:

Run Start



Approvals: Process Plan:

Date:

Tooling:

Date:

Stop



QC:

Date:

SPC (Y/N):

Date:

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID Tool # Plan Accept Reject Reject Insp.
Code Qty Qty Number Stamp

220



SprayPaint

Spray Painting

Spray Painting per QSI005 4.2

0.00

SprayPaint

Memo

0.00

1-Prime inside and outside crosstube as per QSI 005 4.2

2-Paint outside crosstube with White Imron as per QSI 005 4.2

PRIME:

Start Time: 8:30

Finish Time: 9:00

PAINT:

Start Time: 2:00

Finish Time: 2:45

ml 10 09 09 (1)

230



QC

Quality Control

QC14- Inspect Spray Paint

0.00

Memo

0.00

Wrap in plastic bag to protect from scratches

BT 10-09-13 (x1)

Work Order ID 60573

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Page 7

Item ID: D212-664-207

Accept



Setup Start



Revision ID:

Stop



Item Name: Crosstube Low Standard Aft

Start Date: 7/14/10 Start Qty: 1.00



Cust Item ID:

Required Date: 7/23/10 Req'd Qty: 1.00



Customer:

Reference:

Run Start



Approvals: Process Plan:

Date:

Tooling:

Date:

Stop



QC:

Date:

SPC (Y/N):

Date:

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

240

0.00



Crosstubes

Crosstubes

Memo

0.00

Crosstubes

1- Assemble as per Dwg D212-664-247

2- Lightly scuff the bonded area using a 320 grit sand paper and clean the area with 41058 wash 'n' wipe

3- Instal support with magnobond 6398 per dwg D212-664-247, cure for 12hrs before packaging.

Time & date of application: ~~07/14/10~~ 10/30

Batch: 114158

EXP. DATE 01/2011

ml 10 09 13 ①

250

QC5- Inspect part completeness to step on W/O

0.00



QC

Memo

0.00

Quality Control

8/10/14



Work Order ID 60573

July 14, 2010 9:51:59 AM



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Item ID: D212-664-207

Accept



Setup Start



Revision ID:

Stop



Item Name: Crosstube Low Standard Aft

Start Date: 7/14/10 Start Qty: 1.00



Cust Item ID:

Required Date: 7/23/10 Req'd Qty: 1.00



Customer:

Reference:

Run Start



Approvals:

Process Plan:

Date:

Tooling:

Date:

Stop



QC:

Date:

SPC (Y/N):

Date:

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

255



Packaging

Pick Kit

0.00

Memo

0.00

Packaging

20/4/10 *(1)*

260



QC

Quality Control

QC4- 100% Inspect kits for completeness

0.00

Memo

0.00

20/4/10

(1)

270



Packaging

Packaging

Packaging

Memo

0.00

0.00

Identify and pack for shipping as per PPP D212-664-207

NEW A

20/4/10 *(1)*

Work Order ID 60573

July 14, 2010 9:52:00 AM



Page 9

Item ID: D212-664-207

Revision ID:

Item Name: Crosstube Low Standard Aft

Start Date: 7/14/10 Start Qty: 1.00

Required Date: 7/23/10 Req'd Qty: 1.00

Reference:

Accept



Setup Start



Stop



Cust Item ID:

Customer:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop



Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
---------	--------	-----------	------------	------------	---------------	-------------

280

QC21- Final Inspection - Work Order Release

0.00



QC

Memo

0.00

Quality Control

10/09/16
MF
10-9-25

Picklist Print

July 14, 2010 9:51:29 AM

Page 1
3

Work Order ID: 60573

Parent Item: D212-664-207

Parent Item Name: Crosstube Low Standard Aft

Start Date: 7/14/10

Required Date: 7/23/10

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP Rev:A New Issue 07.09.12 EC verified by: JLM
IPP Rev:B ECN 1100p 08-01-11 DD verified by: EC
IPP Rev:C ECN 1121 08-02-25 DD verified by: eC
IPP Rev: D QC5 replaced by QC15 at step 5 KJ Verified by: ec

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
---------------------------------	------------------------	---------------	-------------	---------------------	------------------	-----------------	--------------------	----------------	-------------	--------------	---------------	----------------	--------

D212-664-207TRN

Manufactured

No

110

Each

1.0000

1

1



Crosstube Turning Detail

Location

Loc Qty

Loc Code

LG

1

56783

1

D3660-1

Manufactured

No

140

Each

10.0000

2

2



CUFF

Location

Loc Qty

Loc Code

ST477

10

53501

10

CR3212-4-06

Purchased

No

220

Each

1,441.000

44

44



CHERRY RIVET

Location

Loc Qty

Loc Code

ST311

1441

112492

156

112612

285

112724

200

112794

800

B-50880 MB 10-08-11

2X MB 10-08-17

BT 10-08-31

X44

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Picklist Print

July 14, 2010 9:51:29 AM

Page 2

Work Order ID: 60573

Parent Item: D212-664-207

Parent Item Name: Crosstube Low Standard Aft

Start Date: 7/14/10

Required Date: 7/23/10

Start Qty: 1.00

Required Qty: 1.00

D3595-063-530

Manufactured No

240

Each

109.0000

4

4



RUBBER CUSHION

ml 10-09-13

Location

Loc Qty

Loc Code

FP

72

50030

12

51776

60

LG

37

59581

37

D2940-1

Manufactured No

240

Each

33.0000

2

2



Support

ml 10-09-13

Location

Loc Qty

Loc Code

LG

33

45203

1

47748

12

57338

20

MS21920-28

Purchased No

240

Each

121.0000

4

4



Clamp(per MIL-DTL-8783C)

ml 10-09-13

Location

Loc Qty

Loc Code

FG

5

105884

5

LG

116

112863

24

114749

92

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Shop Packet Print

Page 2

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Picklist Print

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Page 3

Work Order ID: 60573

Parent Item: D212-664-207

Parent Item Name: Crosstube Low Standard Aft

Start Date: 7/14/10

Required Date: 7/23/10

Start Qty: 1.00

Required Qty: 1.00

D3428-1

Manufactured No

255

Each

8.0000

1

1

Placard

Location

Loc Qty

Loc Code

ST056

8

60133

8

MS21042L6

Purchased

No

255

Each

192.0000

6

6

Nut

Location

Loc Qty

Loc Code

ST300

192

111578

4

114495

188

AN9601D616

NAS1149D0663J

Purchased

No

255

Each

0.0000

18

18

Washer

AN6-40A

Purchased

No

255

Each

67.0000

4

4

Bolt

Location

Loc Qty

Loc Code

ST343

67

112828

17

114283

50

AN6-41A

Purchased

No

255

Each

52.0000

2

Bolt

Location

Loc Qty

Loc Code

ST344

52

112805

2

113288

50

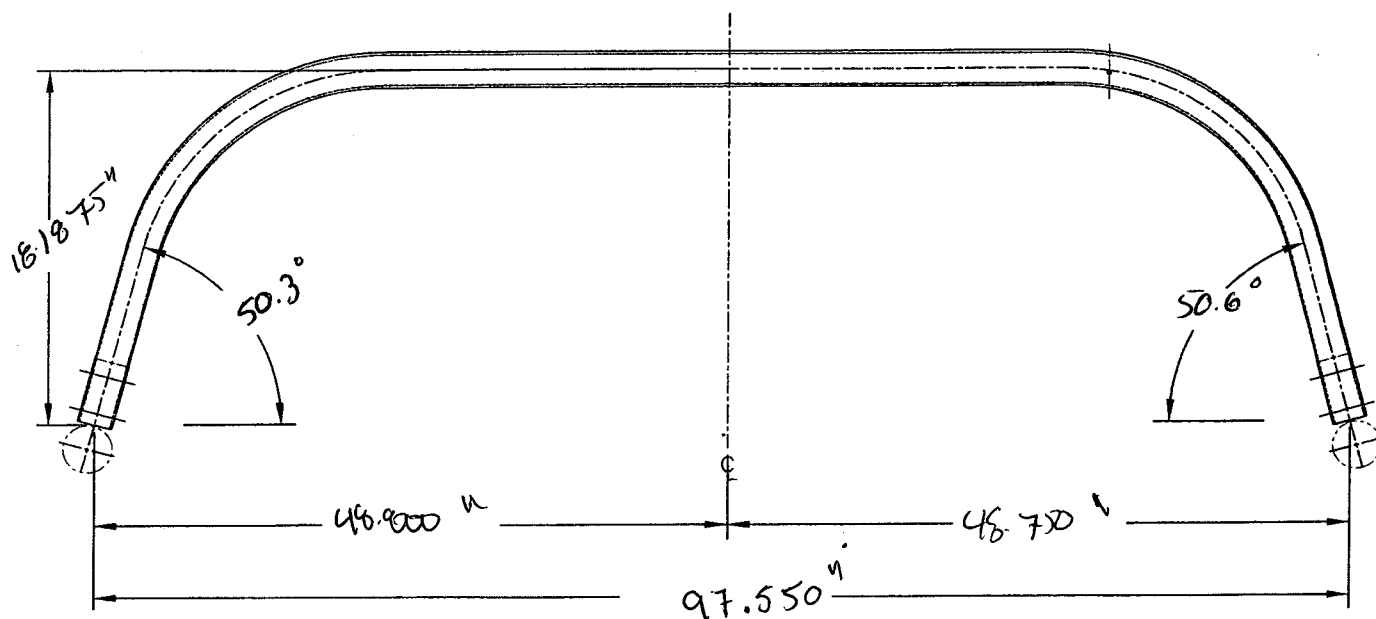
July 14, 2010 9:51:30 AM

Shop Packet Print

Page 3

DART AEROSPACE LTD		Work Order:	60573
Description: Crosstube Low Aft (205/212)		Part Number:	D212-664-207
Inspection Dwg: D212-664-247 Rev: B		Page 1 of 1	

Required Dimension	Min	Max
Height	18.16	18.42
1/2 Span	48.55	48.81
Angle	49	52
Total Span	97.1	97.62



Comments

QC15 Inspection	5
Date	10/05/17

Rev	Date	Change	Revised by	Approved
A	08.02.29	New Issue	KJ/JM	
B	10.04.01	Dwg Rev updated	KJ	

Item	Qty -247	Qty -247B	Part Number	Description
1	X		D212-664-247	CROSSTUBE ASSEMBLY (205/212 LOW AFT)
2		X	D212-664-247B	CROSSTUBE ASSEMBLY (214 LOW AFT)
3	1	1	D6008-132	CROSSTUBE
4	2	2	D2940-1	SUPPORT
5	4	4	D3595-063-530	RUBBER CUSHION
6	2	2	D3660-1	CUFF
7	4	4	MS21920-28	CLAMP (OR MS21920-30)
8	44	44	CR3212-4-06	RIVET (OR M7885/3-4-06)
9	A/R	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION R80-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)
10	A/R	A/R	SIKAFLEX-241/-291	SEALANT (OR PROSEAL 890 OR MIL-S-8802 CLASS B2 SEALANT)

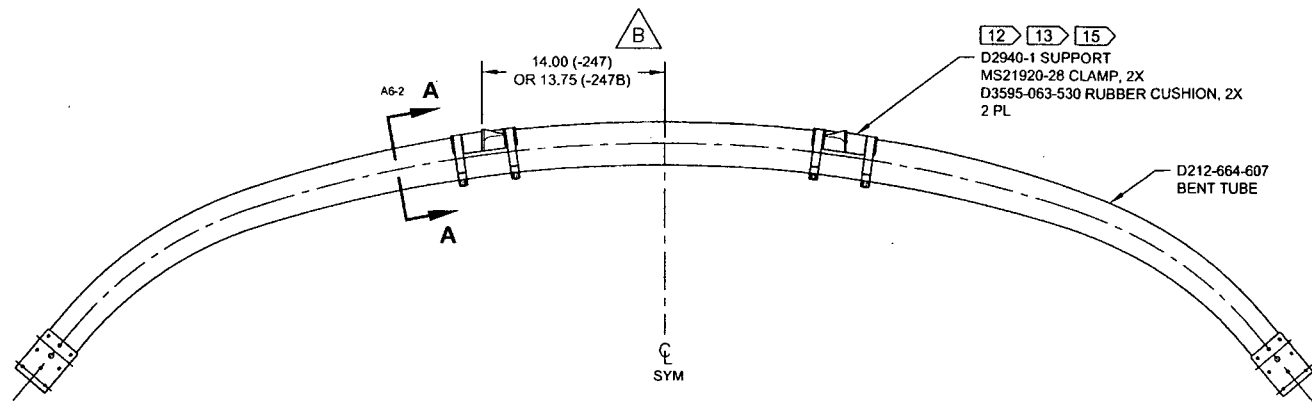
GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6008-132.
FINISHED LENGTH = 128.268±0.020 (BEFORE BENDING/TRIMMING)
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART PART NUMBER "D212-664-XXX" AND BATCH NUMBER ON INSIDE OF CUFF
USING VIBRATING STYLUS.
- 7) WEIGHT: D212-664-247 = 36.6 lbs (PER IIN-D212-664)
D212-664-247B = 36.6 lbs (PER IIN-D212-664)
- 8) PART IS SYMMETRIC ABOUT CENTERLINE.
- 9) WHEN MACHINING TAPER, RUN CUTTER OFF PART. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD
BE SMOOTH.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6%
BASED ON O.D. EXCEPT UP TO 10% IS ALLOWED IN AREA NOTED.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 12) INSTALL D2940-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF
D2940-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER
INSTALLATION AND PRIOR TO PACKAGING.
- 13) INSTALL MS21920-28 CLAMPS (OR -30) WITH D3595-063-530 RUBBER CUSHIONS TO SECURE THE D2940-1
SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE OF CROSSTUBE SUPPORT.
- 14) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE
SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS.
DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE
UNACCEPTABLE.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS
NOT BOTTOMED-OUT AFTER TORQUING.
- 16) INSTALL D3660-1 CUFF AFTER CHEMICAL CONVERSION COAT BUT BEFORE PAINT, WITH A LAYER OF
SIKAFLEX-241/-291 OR PROSEAL 890 OR MIL-S-8802 CLASS B2 SEALANT BETWEEN CUFF AND CROSSTUBE.
SEAL EDGE OF CUFF TO ENSURE NO GAPS.
- 17) TOUCH-UP HOLES WITH CHEMICAL CONVERSION COAT.

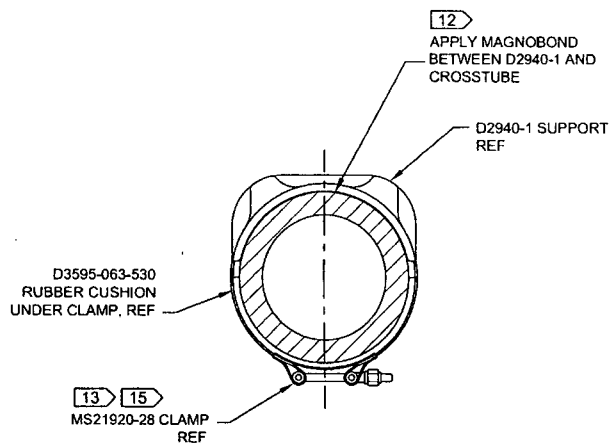
WLB
60573

RELEASED
2009-10-79

B	REVISE GENERAL NOTES/PART LIST; UPDATE TO CURRENT STANDARDS; ADD -247B (ZN C4-2, D5-2)	RF	09.09.30
A	NEW ISSUE	CP	07.07.07
REV.	DESCRIPTION	BY	DATE
DESIGN	RF	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	RF	REV. B	
CHECKED	RF	SHEET 1 OF 4	
MFG. APPR.	RF	TITLE	
APPROVED	RF	SCALE	
DE APPR.	RF	CROSSTUBE (205/212 LOW AFT) NTS	
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D212-664-247/-247B
ASSEMBLY DETAIL

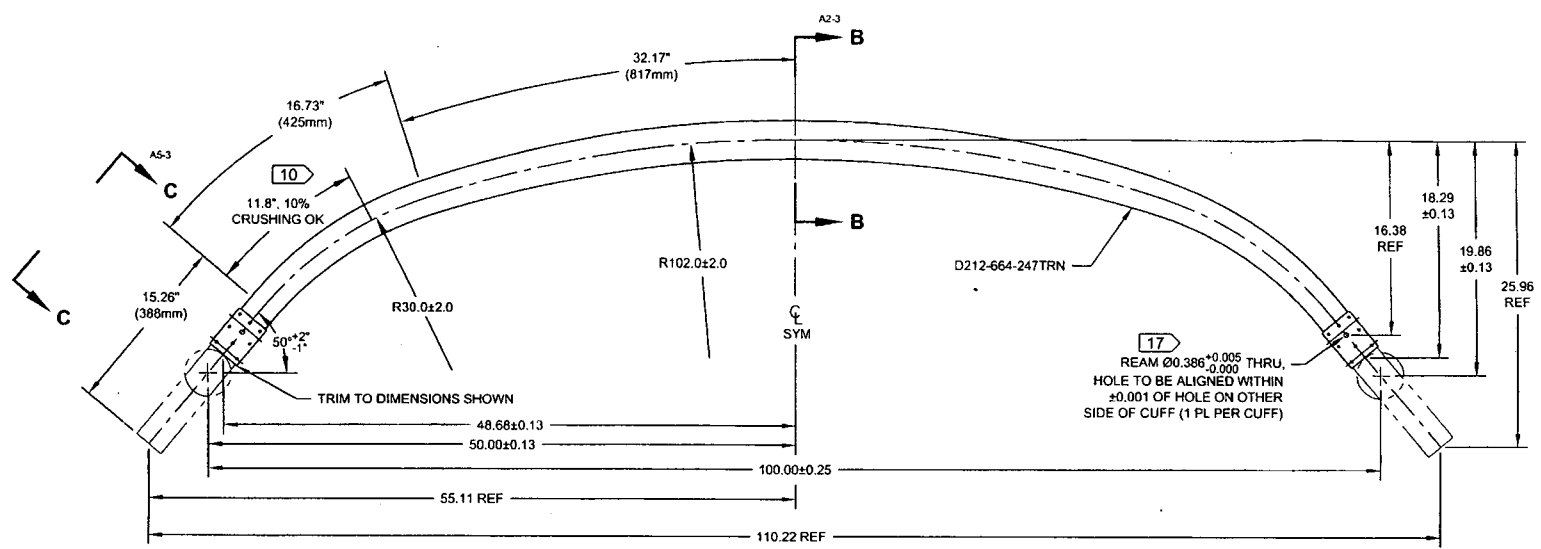


SECTION A-A D6-2
SCALE 4X

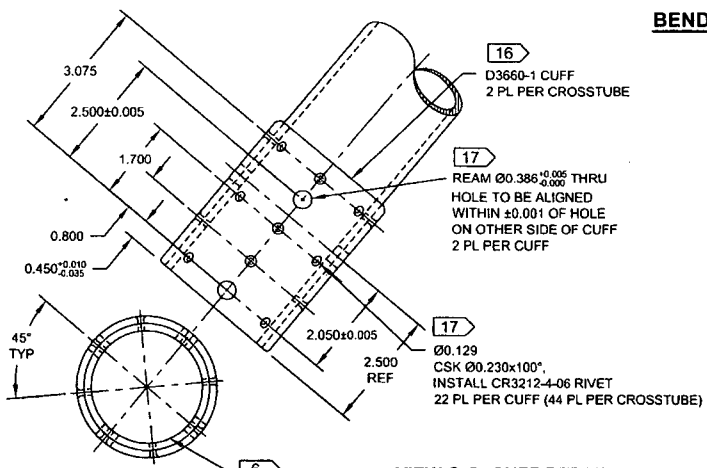
WLO 60573

RELEASED
2009-10-29
WLO

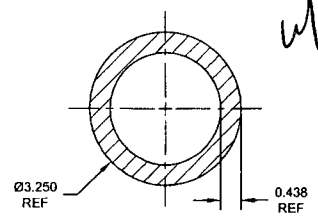
DESIGN	RF	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	RF	DRAWING NO.	REV. B
MFG. APPR.	RF	D212-664-247	SHEET 2 OF 4
APPROVED	RF	TITLE	SCALE
DE APPR.	RF	CROSSTUBE (205/212 LOW AFT)	NTS
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D212-664-607
BENDING AND DRILLING DETAIL



VIEW C-C: CUFF DETAIL 07-3
 SCALE 4X

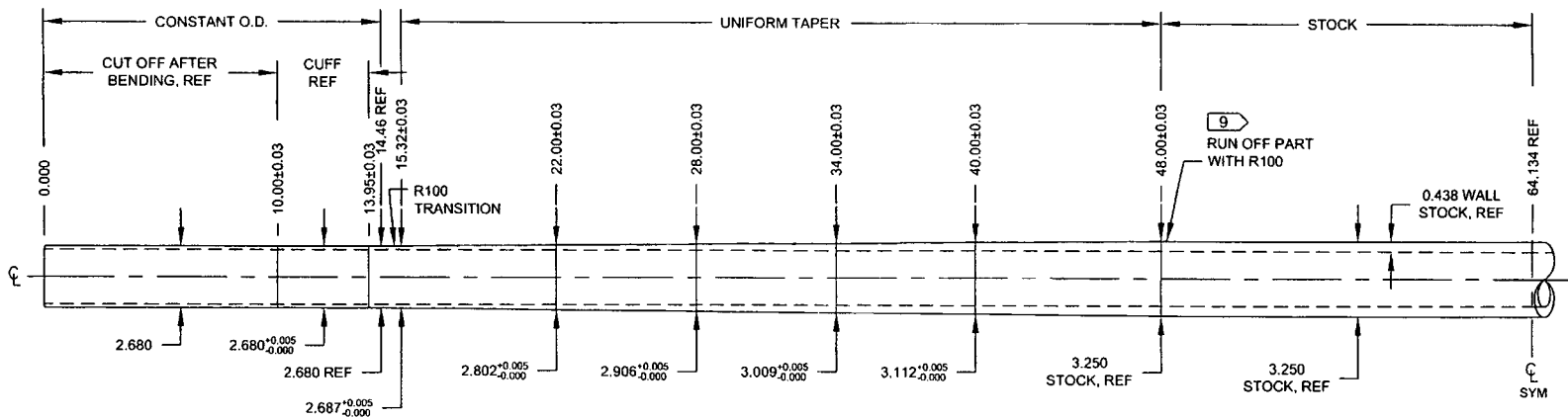


SECTION B-B 04-3
 SCALE 4X

RELEASED
 2009-10-29
W/O 60573

DESIGN	RF	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	RF	DRAWING NO.	REV. B
MFG. APPR.	RF	D212-664-247	SHEET 3 OF 4
APPROVED	RF	TITLE	SCALE
DE APPR.	RF	CROSSTUBE (205/212 LOW AFT)	NTS
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8 7 6 5 4 3 2 1



D212-664-247TRN
TURNING DETAIL

W/060573

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2009-10-29
M

DESIGN	RF	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	RF	DRAWING NO.	REV. B
MFG. APPR.	RF	D212-664-247	SHEET 4 OF 4
APPROVED	RF	TITLE	SCALE
DE APPR.	RF	CROSSTUBE (205/212 LOW AFT)	NTS
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DART AEROSPACE LTD.

IIN-D212-664

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5.2 STANDARD GEAR CROSSTUBES

Item	-107	-207	-209	Part Number	Description
	X			D212-664-107	CROSSTUBE INSTALLATION, 204/205/210/212/214/412, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K STANDARD FWD
		X		D212-664-207	CROSSTUBE INSTALLATION, 204/205/210/212/214, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K STANDARD AFT
			X	D412-664-209	CROSSTUBE INSTALLATION, 412 STANDARD AFT
6	1			D212-664-147	CROSSTUBE ASSEMBLY, 204/205/210/212/214/412, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K STANDARD FWD
7		1		D212-664-247	CROSSTUBE ASSEMBLY, 204/205/210/212/214, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K STANDARD AFT
8			1	D412-664-249	CROSSTUBE ASSEMBLY, 412 STANDARD AFT
10	2			* D2893-1	SUPPORT
11	4			* D3595-063-450	RUBBER CUSHION
12	4			* MS21920-25	CLAMP (OR MS21042-26)
13	4			AN6-35A	BOLT
14	4			AN6-36A	BOLT
15	6			MS21042L6	NUT (OR MS21042-6)
16	18			AN960JD616	WASHER
20		2		* D2940-1	SUPPORT
21		4		* D3595-063-530	RUBBER CUSHION
22		4		* MS21920-28	CLAMP (OR MS21042-30)
23		4		AN6-40A	BOLT
24		2		AN6-41A	BOLT
25		6		MS21042L6	NUT (OR MS21042-6)
26		18		AN960JD616	WASHER
30			1	* D2896-1	SUPPORT
31			2	* D2856-600-1009	ABRASION STRIP
32			2	* D3595-063-570	RUBBER CUSHION
33			4	* MS21920-28	CLAMP
34			2	* MS21920-30	CLAMP (OR MS21042-32)
35			4	AN6-40A	BOLT
36			2	AN6-41A	BOLT
37			6	MS21042L6	NUT (OR MS21042-6)
38			18	AN960JD616	WASHER
39			2	* D3189-1	CHAFING SHIELD
45	2			* D3659-1	CUFF
46		2	2	* D3660-1	CUFF
47	44	44		* CR3212-4-06	RIVET (M7885/3-4-06)
48			44	* CR3212-4-07	RIVET (M7885/3-4-07)
50	1	1		D3428-1	PLACARD

*REFERENCE ONLY. PARTS ARE INCLUDED IN D212-664-147/-247 OR D412-664-249 ASSEMBLIES ABOVE
NOTE: KITS INCLUDE EXTRA HARDWARE FOR COMPATIBILITY WITH BOTH DART AND BELL/AA
SKIDTUBES.

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Revision: F
Date: 08.09.05



LIQUID PENETRANT TEST REPORT

P- 15187

PAGE 1 OF 1

CLIENT DART Aerospace DATE Aug 27-2010 TIME AM ☒ PM ☐
ATTENTION LINDA/CHANTEL ACUREN JOB NO. 188-10-0829
ADDRESS 1270 ABERDEEN STREET PO/VO NO. -
HAWKESBURY ON. WORK LOCATION HAWKESBURY PLANT
K&A LK7 ACCEPTANCE STD. ASTM 1417 REV./DATE 2007
PROJECT F.P.I. 9 on CROSS TUBES
ITEM(S) EXAMINED PCS

JOB DESCRIPTION WET FLUORESCENT LIQUID PENETRANT INSPECTION CARRIED OUT 100% EXTERNAL. PROCEDURE NO. LT-002 REV./DATE - TECHNIQUE NO. LT-TECH2 REV./DATE -
PART NO. - MATERIAL ALUMINE ALUMINUM THICKNESS VARIOUS
SCOPE WET FLUORESCENT LIQUID PENETRANT INSPECTION CARRIED OUT 100% EXTERNAL.

TEST DETAILS

METHOD ☒ FLUORESCENT ☐ VISIBLE ☒ WATER WASH ☐ SOLVENT REMOVABLE ☐ POST EMULSIFIED
FAMILY BRAND MAGNA FLUX BLACK LIGHT S/N 16459 ☐ OUTPUT > 1000 μ W/cm² ☐ AMBIENT < 2 fc
PENETRANT KL 67 MINIMUM DWELL TIME 45 MIN. LIGHTING EQUIP. ☐ FLASHLIGHT ☐ TROUBLELIGHT ☐ OUTPUT > 100 fc @ SURFACE
PENETRANT REMOVER H2O MINIMUM DRY TIME >10 MIN. OTHER LABINO
DEVELOPER SKD 52 MINIMUM DWELL TIME 10 MIN. LIGHT METER S/N 1098866 CAL DUE DATE OCT 19 2010
DEVELOPER TYPE ☒ NON AQUEOUS ☐ AQUEOUS ☐ DRY

TEST SURFACE

SURFACE CONDITION ☐ AS GROUND ☐ AS WELDED ☐ MACHINED ☐ SHOT BLASTED ☒ CLEAN BARE METAL
SURFACE TEMPERATURE ☐ < -4°C/ 20°F ☐ -4°C/ 20°F TO 10°C/50°F ☒ 10°C/50°F TO 52°C/125°F ☐ > 52°C/125°F

RESULTS- (☐ METRIC ☐ IMPERIAL)

1 - CROSS TUBE - W.O. 61038 ✓
1 - CROSS TUBE - W.O. 61037 ✓
1 - CROSS TUBE - W.O. 61387 ✓
1 - CROSS TUBE - W.O. 61388 ✓
1 - CROSS TUBE - W.O. 60523 ✓
1 - CROSS TUBE - W.O. 60524 ✓
1 - CROSS TUBE - W.O. 61036 ✓
1 - CROSS TUBE - W.O. 61035 ✓
1 - CROSS TUBE - W.O. 60573 ✓

8
10/09/14

Scope of Services

The agreement of Acuren Group Inc. to perform services extends only to those services provided for in writing. Under no circumstances shall such services extend beyond the performance of the requested services. It is expressly understood that all descriptions, comments and expressions of opinion reflect the opinions or observations of Acuren Group Inc. based on information and assumptions supplied by the owner/operator and are not intended nor can they be construed as representations or warranties. Acuren Group Inc. is not assuming any responsibilities of the owner/operator and the owner/operator retains complete responsibility for the engineering, manufacture, repair and use decisions as a result of the data or other information provided by Acuren Group Inc. In no event shall Acuren Group Inc.'s liability in respect of the services referred to herein exceed the amount paid for such services.

Standard of Care

In performing the services provided, Acuren Group Inc. uses the degree, care and skill ordinarily exercised under similar circumstances by others performing such services in the same or similar locality. No other warranty, expressed or implied, is made or intended by Acuren Group Inc.

SIGNATURES

CLIENT REPRESENTATIVE Zen Titloy SIGNATURE [Signature] DTR # E27424
TECHNICIAN (SIGNATURE): [Signature] REPORT REVIEWED BY: [Signature]
NAME (PRINT): Mike Johnston NAME INITIALS
1st TECHNICIAN 2nd TECHNICIAN
CGSB LEVEL II SNT LEVEL II CGSB LEVEL II SNT LEVEL II
CGSB REG. No 66606 CGSB REG. No 66606